TECHNOLOGY FOR
Alaskan Transportation
Local Technical Assistance Program

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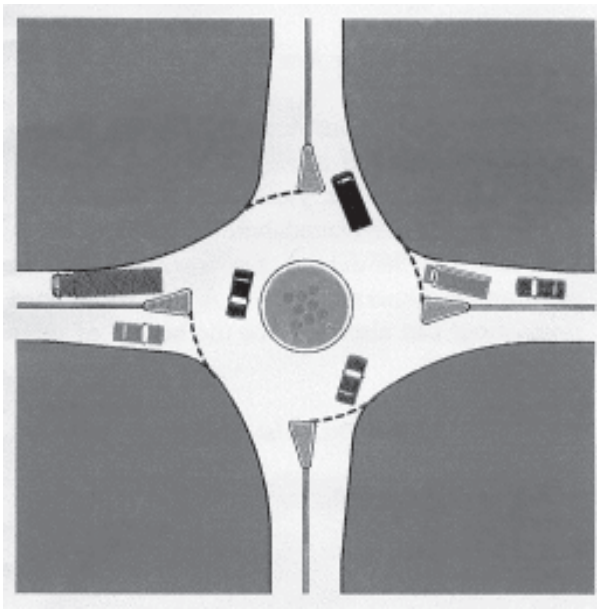
PLUS...

Alaskans May Get Home Faster by Driving in Circles

by Scott Thomas, Engineer, AKDOT&PF Central Region

Just when intersection design seems standardized, along comes a new concept— roundabouts. That's right! Roundabouts are not the large, high-speed "traffic circles" of the old east coast city centers, though they may look similar. With careful refinements, the revised circle is now a popular modern alternative.



Typical One Lane Roundabout

Roundabouts have proven plowable in the snow country of Norway and northern Europe, as well as in Maine, Vermont, Michigan, Montana, and Colorado's busy ski area in Vail. They have been installed at sites intended to process up to 5,000 vehicles per hour. They pass all sizes of trucks and emergency response vehicles. With these and other benefits, it is no wonder Alaska is considering them.

BENEFITS

Modern roundabouts offer design features that are difficult to ignore when faced with a tough intersection problem. Roundabouts require no signal hardware…no loops in the pavement…no electrical systems…no controllers…no central computers… and —surprise!— low maintenance. There is often less visual hardware and more landscaping. They require less space than other options.

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TRAC ACTION

by Sharon McLeod-Everette, T2 Manager

Now in its third year, the AASHTO TRAC (Transportation Research Activities Center) program continues to percolate in classrooms across Alaska. DOT&PF subscribes to AASHTO's mathematics and science outreach program, which encourages middle school and high school students to consider a career in civil engineering. TRAC provides computers; a suitcase full of hardware such as magnetic strips, plastic rails, sound meter, and a force probe; and software. DOT&PF engineers partner with classroom teachers to bring real-life, everyday examples of engineering to the students.

Starting up the force probe software.

The last week in January saw TRAC teachers in the Fairbanks area gathering at Northern Region DOT&PF to pick up new computers, meet engineer partners, and come up with a common lesson plan. West Valley High School now has two TRAC computers, which will be shared among Marty Foster, Mary Wyatt, and Roy Roehl. Howard Luke teacher Gary Adkins received a new one (the former computer went to Barrow when teacher Jim Grey relocated there), and North Pole, with Steve Paskvan as teacher, came on line for the first time.

Standing: Mary Wyatt,Lorena Hegdal,& Billy Connor. Seated: Steve Paskvan &Gary Adkins.Back to the camera: Marty Foster & Janet Brown.

Fairbanks DOT&PF engineer partners are: Janet Brown, M&O; Billy Connor, Research; Lorena Hegdal, Design; and Jim Sweeney, Preliminary Engineering. Jim Bennett, Research, also spends time with TRAC doing initial troubleshooting and all-around handyman activities.

Two other participating schools and teachers to receive a second computer and TRAC PAC are Juneau Douglas High School, Carol May; and Homer High School's teaching duo of Dick Sander and Bill Craine. Homer High School boasts three students who've entered a college engineering curriculum (one in their third year) as a direct result of AASHTO TRAC.

Bethel High School, Chugiak High School, Colony High School, East High School, Glennallen High School, and Kotzebue High School also participate in AASHTO TRAC. Partner engineers are: Blaine Galleher, Construction, Nome; Elmer Marx, Bridge Design, Juneau; John Paulson, Design, Valdez; Miriam Tanaka, Design, Anchorage; and Victor Winters, Design, Anchorage.•

For more information about what is happening with TRAC in Alaska, turn to page 12.

Clarification

In Gerald Reed's article, "Alaska Department of Transportation & Public Facilities Snow Policy," we printed that the department does "not block any driveways." It should have said," driveways will most likely be blocked." We apologize for any confusion this may have caused.•

Publications Available from Bureau of Transportation Statistics

Contact BTS at (202) 366-DATA for a copy of the *1995 American Travel Survey: Long-Distance Leisure Travel in the United States,* and *Telephone Contacts for Users of Federal Transportation Statistics 1999*.•

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Roundabout theory is simple and makes sense. Vehicles enter by making a right turn. There are no left turn phases to rob green time from mainline traffic. Ever noticed how right turn lanes don't seem to back up as much as left turn pockets at traditional signals? In right turn lanes, the driver is permitted to turn on a red indication, making an active decision to use all available upstream gaps to enter the intersection. More efficient lane capacity use is realized at right turn lanes than at left turn or through lanes. Traffic keeps moving with no "all red" or clearance loss time. At signals, left turns and through vehicles must wait on a passive red signal indication, even when no one is present.

Better utilization of the intersection means reduced overall fuel consumption, less idle time, and improved air quality. No left turns and lower intersection delay means roads in between do not always have to be widened to multilanes.

Compared to traffic circles, key roundabout features improve operations by controlling speed and approach entry. Circle diameters are smaller, in the 50-150 foot range, with no inside parking or striping. Approach lanes deflect to the right edge rather than using head-on designs. Flared entries allow multilane, multivehicle right turns. These features keep circulating vehicles from being trapped inside, reduce speeds to 20 mph, force entering traffic to yield, and add high capacity entries.

There are also safety benefits. No left turns means no angle accidents. Greatly reduced speeds translate into less severe accidents. Reduced rates and severity have been proven in Europe and in the U.S.

CAPACITY

Most engineers agree that roundabouts work best when there are equal demands on all approaches, and/or high left turning volumes. There are as many design methods as qualified practitioners. Experts disagree on the best roundabout applications. To help resolve the issues, FHWA has contracted development of a new U.S. guideline.

One design manual suggests that a one-lane roundabout is limited to 2,570 entering vehicles per hour, while a 3 lane circle can practically process 6,000 vph. Some roundabout proponents have said theoretical capacity is much higher. At higher volumes, signals are thought to be more efficient. Most states are breaking ground with one to two lane roundabouts and several are pursuing roundabouts at interchanges.

PROBLEMS

Alaska traffic engineers are concerned with how to safely assign pedestrian right of way across multiple right turn lanes. Crosswalks are typically placed one to three vehicle lengths behind the multilane approach where the crossing is narrower, especially when using refuge islands. Pedestrian and traffic volume combinations should be low enough to create adequate gaps for crossing. Under high volumes, demand triggered push-button signals can be used to meter ramp traffic, or pathway grade separations can be provided.

Routing bicycles is often a concern. With low speeds and entry control, bike lanes have been merged into higher volume roundabouts. Studies show mixed results when comparing bicycle accident statistics to other types of intersection control.

Low navigating speeds means that roundabouts are not suited for the middle of arterials where signal green bands and progression at higher speeds are a goal. They also do not perform as well on steep grades; a 2% bench is often required.

DESIGNS IN ALASKA

DOT&PF engineers began exploring roundabouts several years ago with Washington Street and Rewak Drive in **Fairbanks**. An exchange in traffic between a major retail mall, frontage roads, and a neighborhood street resulted in cut-through traffic, which became an issue as soon as the mall opened. A roundabout was mapped within the narrow right of way. However, enough disagreement on the applicability of roundabouts resulted in an unsignalized stop controlled design being used instead.

In **Wasilla**, the Department's traffic engineers drew a roundabout alternative for two offset "T" intersections of Main Street/Bogard Road and Fishhook Road/Nelson Avenue. Equal traffic demand on all approaches and a history of angle accidents fit well. Right of way was limited. Costs were about the same as for a new signal, discounting maintenance. In October 1997, concern was raised for adjacent school operations, and the community response favored a signal, so the roundabout was scrapped.

At the "Y" in **Big Lake**, a roundabout was fitted to a rural two lane roadway intersection to control traffic speeds and provide turning opportunities under heavy summer recreational volumes. It also would serve as a

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The Myth of the Magic Button

by Dana Harris

Recently I attended a meeting concerning a newly developed prioritization process for highway projects. Everyone there was excited about the possibility of a computer program that could rank projects based on factors from traffic counts to economic impacts.

However, when it was mentioned that some data sources were of questionable quality and that a "reality check" of the results by knowledgeable personnel was required at the end of the process, the mood changed. Managers suddenly became disillusioned, one saying that the whole idea should be "scrapped because it is of no use if it can't just tell us the answers." Ah, the myth of the magic button is alive and well!

The idea that a computer program can provide answers to questions simply by inputting minimal data and hitting "enter" is what I like to call "the myth of the magic button." Today's computers and software programs provide many things—and they are indeed wonderful tools — but they do not have all the answers. **The magic button does not exist.**

This is especially true in fields such as transportation planning where many human elements are at play. The day a software program can accurately answer any question about reasoning behind travel patterns, funding decisions and the political climate of road development is the day I retire and start living the life of George Jetson!

Before I continue, I want to make it clear that managers aren't alone in wanting computers to make decisions. Look at just about any consultant's proposal, scope of work or transportation plan and you are sure to see at least one reference to an expert system. Some expert system proposals are grounded in reality but many are built on belief in the magic button.

Why is this? Why are we, as educated, experienced professionals so willing to give up control to a number-crunching box? Have we really gotten so lazy that we are not willing to do the extra work to get the best answer, not just "an" answer? Have we lost our ability to reason and use common sense, or are we or we will simply be afraid to make the hard decisions ourselves?

Maybe our tendency to put too much faith in computers comes from a belief that powerful, decision-making machines are an unavoidable part of our future? I don't hold this view. Don't misunderstand, I do believe that "thinking" machines will one day be commonplace, but they have a long way to go before they match the complexity and depth of the human mind. After all, we love movies where space-trekking Earthlings, using the most advanced technology we can imagine, reach their own heroic, human conclusions about how to conquer adversity. And no one wants a self-aware Hal-like computer calling the shots. We're not ready to give up our dreams of shaping the future, so why do we seem so ready to give up our control and expertise on the job?

You may think I'm bold— or just a little crazy— to write an article saying that computers don't have all the answers for a magazine that showcases computer applications for the transportation field. However, I think this is exactly where such an article should appear. We transportation professionals and users of advanced software packages need to understand that the many advanced programs available are terrific assets but they still need a human touch. We must convince those around us that our job is not done when a computer spits out a few impressive-looking statistics and reports.

With a bit of work we can— and should— take control of our computers and the "expert" software they run. By following the tips below we can maintain good, old-fashioned, common sense quality in results while still making use of the powerful machines on our desks.

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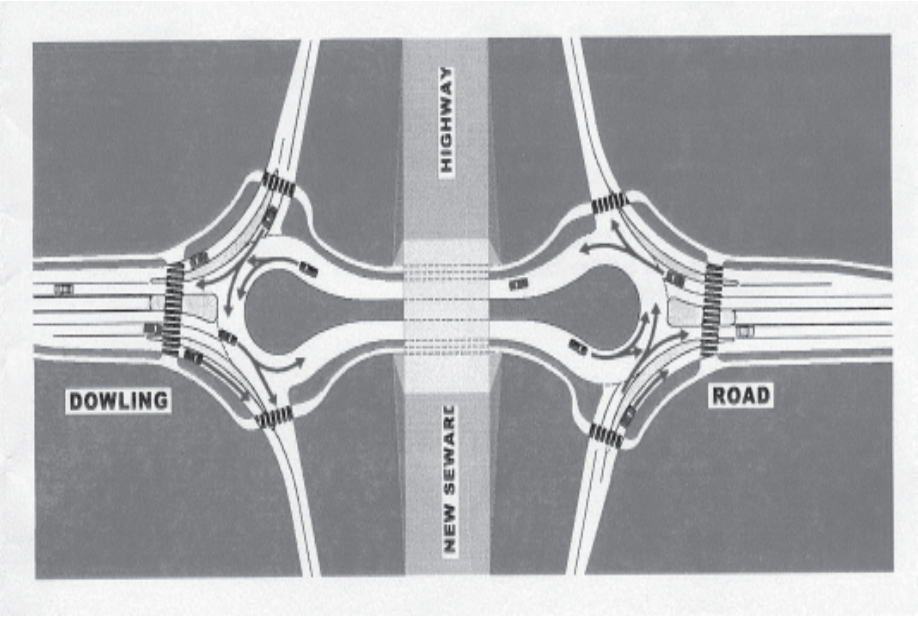

Roundabout Interchange Concept for Dowling Road and the New Seward Highway

gateway to the local business district. Community concerns over the speed reduction of through traffic caused this idea to drop in favor of a rebuild of the "Y".

To help clarify the debate, DOT&PF's T2 Center and Institute of Traffic Engineers (ITE) Alaska sponsored seminars in Anchorage and Fairbanks in March 1998. The firm Ourston & Doctors provided an overview of roundabouts. They had proven knowledge of various design standards as well as experience in designing projects of all sizes. Several were in snow areas and many had actually been constructed.

The latest location inked on plan sheets is the **Dowling Road Interchange** on the Seward Highway in **Anchorage**. Dowling is to be widened from two lanes to five lanes. Roundabouts are well suited for congested, tight-diamond interchanges. In place of ramp signals, two proposed roundabouts eliminate queuing under the overpass. No short, overloaded left turn lanes are necessary. This means the existing bridge embankment does not have to be tied back with reinforced walls to gain greater width. Right of way needs are reduced. This option is estimated to save $1,000,000 in construction costs and $18,000 per year in upkeep of two signals. The project is at the 70% design completion stage prior to construction.

FUTURE POTENTIAL

In Anchorage, a roundabout option may help tap into underutilized capacity areas. Sketches to improve capacity and utilization of the current one-way frontage road system on the **Seward Highway** used roundabouts. With new bridge crossovers at ½ mile spacing, two-way frontage roads would terminate just prior to ramps using roundabouts. One-way ramp operations would continue, while local traffic could better utilize frontage roads, reducing arterial demand across the Seward Highway. A reconnaissance study is ongoing.

Southeast traffic engineers have studied potential locations in the **Juneau** area, finding eleven sites where single lane roundabouts could improve operations. These are primarily on the Glacier and Douglas Highways.

Several smaller cities have struggled for road solutions serving commercial districts and commuters, while still providing a sense of community. A five-lane section with pathways usually fills the available right of way. Through traffic speeds are generally in the 45 mph range. Signals are needed for busy left turning traffic and to create gaps to cross the road and enter traffic. The arterial generally has little valuable space left to meet the public and the Department's desire for improved walking, buffers,and landscaping.

The demand for internal traffic circulation within these cities often exceeds the pass-through demand. Some of the five-lane cities balancing pass-through traffic and speed control issues include: **Soldotna, Kenai, Eagle River, Wasilla, and Palmer.**

To benefit the most users, a roundabout on each end of the community would provide a positive means of achieving speed control, transfer of traffic, transition to urban area, landscaping and "welcome" or gateway opportunities. The need for signal maintenance would be reduced. Positively forcing slower speeds means shorter judgement times for pedestrians and crossing cars, and

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Making Effective Technical Presentations

by Nazir Lalani and Steven B. Colman

For many career-oriented professionals, there is both a need and an honor in making technical presentations in front of a group of peers, a citizens group, or elected officials. Regardless of the nature of the presentation, the speaker owes it to the listeners to plan, write and deliver the presentation in a professional, convincing manner.

At conferences, speakers should recognize that their audience members are taking valuable time as well as spending significant amounts of money to attend and hence are owed a honed presentation. But in any instance when technical information is poorly presented, the speaker will lose the audience and may not persuade many to understand or support key points of the presentation.

This article discusses the most important items to consider before making a technical presentation are:

- The content, the audience and the environment in which your presentation will be made.
- The tools you will use to make your presentation effective and also your appearance.

Speaker Preparation

Technical speakers usually are invited to take the podium and present a summary of the main points of the topic. In preparation for an oral presentation, speakers should address the following issues.

Audience. Know your audience! When you are invited to speak, ask the sponsor how many people will be attending the presentation and their interests and backgrounds. If you are not familiar with the audience, contact those who are so you can tailor your remarks to the level and interests of your audience. Ask yourself these questions: Who is the audience; what do the audience members have in common; why have they invited me to speak; what do they want me to talk about?

Message. In preparing your discussion, clearly identify what your audience needs to know and the message you want ringing in their ears as they leave. Share that message during the presentation and remember to answer your audience's main question, "What's in it for me?" A presentation is a three-act play with a beginning, middle, and an end. Each part must be clear and distinct but at the same time the three parts must work as one.

Technology Transfer. Make sure your presentation contains at least one idea that your audience can take away and implement immediately.

Delivery. Do not read the paper or a summary of the paper. Tell your story by highlighting points that best illustrate your agenda. Use anecdotes to illustrate key points.

Length. Presentations should be as short as possible to convey the main points. Even if you are not given a time limit, most presentations should be limited to no more than 15 minutes. Audiences will forget the beginning and middle and remember only the end, or will become bored with the topic if the presentation lasts too long. As someone once said, "Pretend each word you speak will cost you $100 and then see what you can cut."

Audience Attention. Slides should not be left on the screen for more than 20 seconds. The attention of the audience will wander if slides are left on for more than a minute. Use either 35mm slides or overhead transparencies. Switching between the two is distracting. Talk to your audience and not the screen.

Sequence of Events. Include relevant time frames and a sequence of events in your discussion so that the audience has a sense of the order and time frame in which important events ossurred.

Enthusiasm. Of the messages discerned by an audience, 60 to 80 percent are nonverbal. Therefore animation, enthusiasm and voice inflection are important in communicating effectively with an audience. Don't be afraid to exaggerate these. If you don't appear interested in your paper topic, why should your audience be?

Pace. Nervous presenters frequently speak too quickly and should try to speak slower than in normal conversation, pausing between major points. Remember that pauses will seem much longer to you than to the audience. The greatest actors in the world have learned to speak slowly but with great animation. To help you speak at the right pace, start inhaling deeply and deliberately

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until your lungs reach capacity. Exhale fully and slowly. Reach a comfortable rhythm. Stay with it as you speak and you will feel calmer and more energeretic. Speak plainly and avoid jargon if possible.

Dynamic Techniques. Using quotes and surprises help to make presentations more dynamic. The best quotes are short, memorable, and best used at the beginning of the presentation. Always make sure quotations are clearly attributed.

Use surprises to draw attention to the point you are about to make. Saying something surprising can reawaken and audience. Repetition builds greater awareness of the central points of the main theme and contributes to the flow of the presentation.

Eye Contact. Look at your audience when speaking. Do not gaze into the far distance. Eye contact establishes a strong bond between you and your audience and signals your sincerity. As you begin to speak, look at people in the back and center of the room. As you move to your first thought, pick someone to deliver your message to for four or five seconds. Then pause, turn, and deliver a point to another person. On occasion, scope the entire room slowly, taking in the audience with one deliberate sweep. Return to those in the back and center, then focus on individuals again.

Stock photo of Dave Esch.

Humor. Telling a joke is a good way of attracting the audience's attention, especially at the beginning of a presentation. However, be careful with humor: you do not want to tell a joke at the expense of anyone in the audience . If you are planning to use a joke, test it on friends or collegues first to determine if it will be effective.

Nervousness. It is acceptable to be nervous— it shows you care about what you are doing. Nervousness is simply energy. The key is to control that energy and appear calm. Put it to work for you. Remember that you know more about the topic than the audience —that is why you are there!

Audiovisual Equipment. Make sure the conference sponsors know what equipment you will need well in advance. Check the amplification system and become familiar with operating it before the session. Make sure it is loud enough that everyone in the room will be able to hear you.

Rehearsal. Rehearse your presentation at least three times before arriving at the conference. If possible, use an empty meeting room or auditorium with your visual aids. This will help you help you to familiarize yourself with your slides and overheads, as well as ensure proper orientation and order. Pay attention to weak points in your delivery and work on improving them.

Role

Be mindful of your role as an official spokesperson for your organization.

First Impressions. Your audience will judge you by their first impression, including your physical appearance. Therefore, create a strong opening. It is also important to wear the correct clothing and have proper grooming. Business attire that avoids bright reds and whites is the best. Also, avoid heavy, bulky, baggy or shiny clothes and loud stripes. Large noisy jewelry can be distracting to the audience. It is better to dress slightly "up" from the level of your audience to show your respect.

Gestures. Gestures help to reinforce your verbal communications. They assert your authority and signal to an audience the impact of your words. If you clasp your hands in front of you or let them hang at your side, you are visually telling your audience that you are not ready to take control. Without any gestures you may appear nervous and uncertain.

As you make a presentation, keep your hands waist-high. Audiences won't believe you if you touch your face or if they cannot see your hands at all. Let your hands bracket your ideas. When you come to an issue of major concern, pause and hold up a hand. It's a natural way of signaling that you are about to say something of greater importance than what has gone before. Remember that larger audiences need larger gestures. Gestures can give

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rhythm to sentences by creating pauses so that everything does not run together. No hands in pockets. Stand tall. Don't rest on one hip. It is important to remember that movement should be natural, realistic, direct and smooth. Swaying, playing with the face and hair, or fiddling with clothing can be distracting to an audience.

Answering Questions from the Audience

At the end of a presentation there typically is a question and answer session that is controlled by the moderator. When answering questions from the audience, it is important to bear in mind the following advice.

Be Direct. Do not be evasive. Evasiveness is usually interpreted as a signal that you have something to hide. Compliment the person asking the question. Don't apologize. Use statements beginning with "I" if there is significant controversy.

Be Positive. Be positive, not defensive. Tell the truth and be candid in response to questions. Don't attack other organizations or competitors.

Be Confident. Show confidence. Take a small step forward when giving answers.

Eye Contact. Don't hide behind the podium and always look at the person asking the question. Try to keep answers to less than a minute.

Control Anger. If a member of the audience makes you angry, count to ten before responding. Avoid an argument. Be careful of nonverbal cues (crossed arms, not looking at the audience) that can increase the level of confrontation.

Interruptions. If interrupted in the middle of a thought, proceed with your original answer before changing the subject. Avoid playing verbal ping pong. Broaden your answer to make your point.

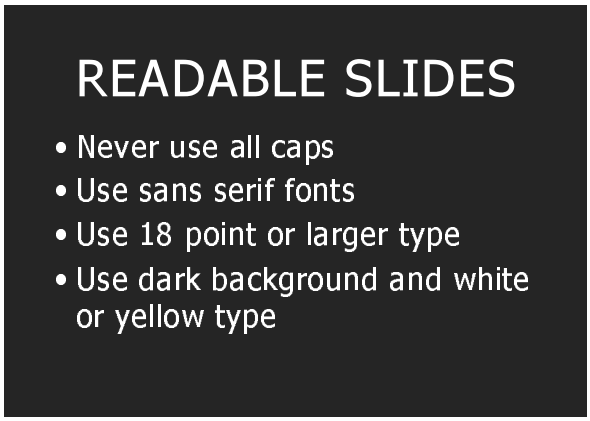
Additional Information. If you don't know the answer to a question, say so, and offer to find out. Then provide the information as quickly as possible.

Visual Aids

Technical presentations can be made more effective with the use of visual aids. Audiences typically assimilate 80 percent of their information visually. Overhead transparencies or 35mm slides are both acceptable. In some circumstances, videotape may also be used effectively, though it frequently makes an oral presentation unnecessary. Remember: slides and transparencies are intended to enhance your presentation, so avoid overusing them. Prepare your presentation, then select points you wish to emphasize in your visuals.

Use of Slides. Slides should present information that re-emphasizes what is being presented verbally. Use the slides or overheads as prompts for your presentation, but don't read the slide. Slides are most valuable when portraying a complex, real-world situation, such as intersection conditions or sight-lines from a driveway.

Slide Format. Each text slide should contain no more than five or six lines of 18 point or larger text and a total of no more than 15 words. Slide text should fill the screen and type faces should be consistent throughout the presentation. Avoid the use of all uppercase since it is harder to read. If smaller text containing more words is used, the audience will be unable to read or will be distracted trying to read the small text. Sans serif bold fonts, such as Helvetica, are most readable. Good slides are seldom made from the tables or figures intended for publication with a paper.



Slide Colors. White or yellow letters on a dark blue or black background are the most visible colors for 35mm slides. Black letters should be used for overhead transparencies. Red and light blue letters should be avoided as they are difficult to read. Avoid more than two colors per slide and the use of decorations such as tick marks and grids.

Location Map. In discussing a project in a specific place, include a map showing the location of the project at the beginning of the presentation.

"Real Life" Slides. In between slides of text, slides of relevant real-life situations should be included. This

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Portable Rumble Strip

by John Hibbs, P.E. Kentucky LTAP Center

Protection of flaggers was one of the key objectives addressed by SHRP researchers. Great hope was placed on the portable rumble strip to be extremely helpful in alerting drivers as they approach work areas where flaggers were working. The strip weighs 80 pounds, is made of plastic, measures 18" wide x 10' long, is tapered in cross-section, and is one and one-eighth of an inch thick. The *Manual on Uniform Traffic Control Devices* (MUTCD), Part VI, was altered to permit the use of portable rumble strips.

A 10-foot long by 18 inches wide, plastic portable rumble strip (under the car) is being used to alert drivers as they approach the work zone where pavement is being repaired.

However, the resulting use has been rather disappointing. The basic problem is that, if used on high-speed roadways with trucks, the devices move so much under the traffic that a worker must be assigned to keep the strips in place. The rumble strip was developed to provide protection for workers, thus assigning a worker the hazardous duty of maintaining the device in the traffic lane is a counterproductive safety activity.

The Kentucky Transportation Center, University of Kentucky, purchased six of the rumble strips and moved them about, from agency to agency. If used on a 45-mph or slower urban facility, they worked satisfactorily and were noted to slow traffic before it reached the flagger. Some successful use was experienced on 55-mph roadways with light truck traffic. One state highway maintenance office used the devices successfully, and requested to keep the strips for future use after the testing period was over. They elected to use two strips in a row, spaced about 300 feet apart at a distance ahead of the flagger.

The crew managing traffic operations at the Cumberland Gap Tunnel (Kentucky/Tennessee border) used two rumble strips during the flagging operation, but for a short time only. A number of the local coal-truck drivers tested the strips for resistance to locked brakes under a heavy load of coal. The rumble strips lost the contest, and there was not enough left to bring home after the testing operations.

The Traffic Engineer for Anchorage, Alaska reported a very positive use of the rumble strips. Forty units were purchased and have been successfully used for the intended purpose. Also, some local citizens have requested permanent installation for speed control or traffic calming in residential areas.

The most negative comments regarding the use of the rumble strips came from Washington State where they bought several for each district, and all are now out of use. A video shows how they move under traffic, especially trucks with low clearance, such as vans hauling wood chips. Sometimes the strip was left humped in the middle creating a hazard for vehicles with low clearance.

At the current time there remains only one known supplier of the plastic rumble strip. It is supplied by Poly Enterprise, Monrovia, California, 91016, (Al Provence, Phone 818/358-5115) at a cost of about $60 each.•

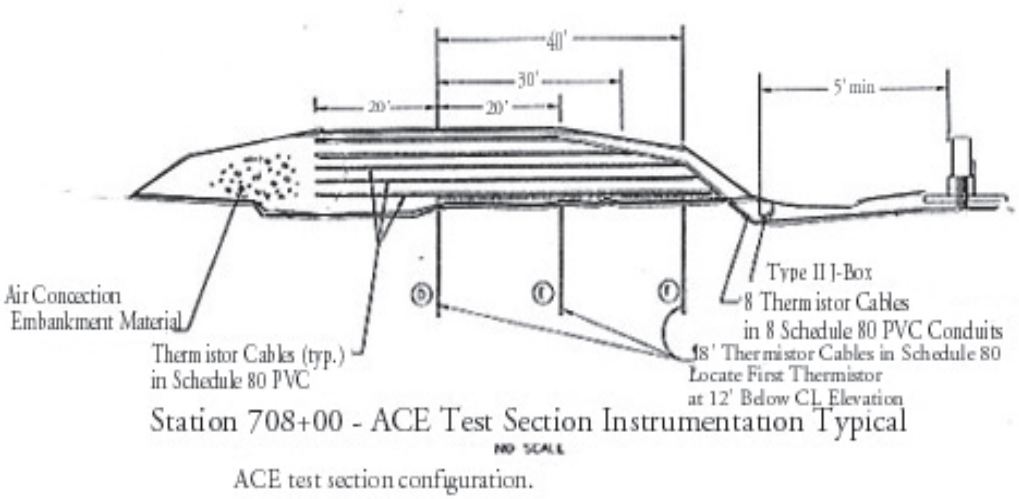
ASCE & CRREL Cold Regions Conference

ASCE & CRREL will host the 10th International Conference on Cold Regions Engineering, to be held at TheMountain Club on Loon in Lincoln, New Hampshire, August 16-19. The theme is "Putting Research into Practice," which emphasizes the importance of brining new ideas & findings from research into practice. Tenative topics to be presented include: construction, transportation, frozen ground & permafrost, foundations, hydrology & hydraulics, & remote sensing applications. A preconference short course on a new computer model for pavement design by FHWA and a tour of the highly specialized research facilities at the Army's Cold Regions Laboratory are scheduled. For more information see the Calendar on page 14.

Research Projects Review

Experimental Features Program

Statewide Research coordinates with Federal Highway Administration's Experimental Features Program, encouraging innovations in state highway design and construction. The program provides access to federal funds for new and unproven features. Funding for each experimental feature is included in the construction project; usually, the feature is designated in the bid schedule as a separate bid item. Funding for monitoring the feature comes from the Experimental Features Program, not from construction dollars.



Copy of model used in Air Convection Embankment project on Chena Pump Road, Fairbanks, Alaska. Monitoring the project was funded by the Experimental Features Program.

There are essentially two criteria for an innovation to qualify as and experimental feature. First, it must have potential benefits for DOT&PF or the public. Second, use of the feature must be followed up with an evaluation of its success, along with recommendations for its use in the future. Experimental Features can be a new process or technique for using conventional materials and equipment. Evaluations are typically simple, or quite complex.

Alaska Marine Highway System Marketing and Tariff Study

This research project is designed to discover and understand trends and preferences of current and potential Alaska Marine Highway System (AMHS) riders. From the information gathered, we expect to determine how best to market the services AMHS provides, and to increase ridership and revenues. The desired goal is to understand current market and economic trends and conditions as well as internal business practices and policies so that AMHS can become more self-sustaining.

Pavement Traffic Markings

The project evaluates pavement marking materials for durability, reflectivity, and cost effectiveness. The evaluation includes considering materials that are effective during both maintenance activities and new construction. DOT&PF will use the results of this project to develop a Departmental policy for traffic markings, and possibly a warranty specification. We expect that using improved, more durable, and/or more cost-effective pavement marking materials will reduce maintenance costs and improve roadway safety.

Statewide Revegetation Manual

The Statewide Revegetation project will address aspects of revegetating highway and airport construction and maintenance projects in Alaska. DOT&PF's goal is to establish site-specific recommendations and specifications based on current knowledge about seeds and plants, and their growing requirements, including information from the University of Alaska's Plant Materials Center in Palmer. The resulting manual of practice will comply with erosion and pollution control regulatory mandates. It will provide practical guidance for stabilizing and revegetating soils that are disturbed or exposed during project development, construction, and maintenance activities, along with standardized recommendations and methods for establishing permanent, living vegetative cover. The manual will include recommendations specific to the different geographical growing regions in Alaska.

Verification of Roughness Coefficients When Modeling Streamflow in Alaskan Streams

Continued development and improvement of Alaska's roads requires designing many stream crossings. Currently, there is very limited hydrologic data to use when designing bridge and culvert installations, which means that designers typically have to guess streamflow and scour computations. Knowing roughness (friction) coefficients will improve modeling of streamflow. We expect improved scour computations and more cost-effective bridge and culvert designs, along with reduced scour once a bridge or culvert installation is in place.

Stabilized Sandy Gravel Surfacing in Cold Climates

This project investigates the feasibility of using on-site gravelly materials together with a combination of stabilization products and closely controlled moisture contents to provide local-source surfacing on large rural construction projects in cold climates. Rural areas have limited on-site sources of either marginally clean sand and gravel or only silt. These on-site materials lack either the fines or coarse aggregates suitable for surface material. Thus, many rural construction projects incur high surfacing costs due to the expense of barging materials in. Successful warmer-climate work to stabilize these types of soils by using various products on the market indicates that similar success could be achieved in cold weather. Cold-climate projects already constructed have used some of these materials, but the performance has not been evaluated. Visits to these projects to analyze site surfacing materials performance such as material strength properties, moisture content, and other relevant properties will result in recommended techniques to improve cold-climate stabilization.

Development of an Economical Best Management Practice for Snow Storage Areas

This research will: a) study potential water quality effects from snow collected from streets and roadways, then stored at central locations, and b) address methods to deal with the effects that snow storage has on water quality. Developing an economical Best Management Practice (BMP) for snow storage should greatly alleviate the present concern that regulatory agencies have about by byproducts of snow storage: petroleum products, anti-icing and deicing chemicals, and other substances. Those byproducts are what can contaminate or pollute nearby surface and groundwater during springtime melt.

Fairbanks North Star Borough snowdump site.

For more information on research projects in Alaska, contact Billy Connor, Research Manager, at (907) 451-5479 or billy_connor@dot.state.ak.us.•

TRAC Partners with West Valley Teachers for Engineer's Week

by Sharon McLeod-Everetter, T2 Manager

DOT&PF Northern Region engineers gave students in four West Valley High School classes a hands-on introduction of what transportation engineering is about. Janet Brown, Bill Cole, and Lorena Hegdal teamed up with teachers Karen Boyle, Marty Foster, Kristin Radcliffe, and Mary Wyatt to present two different bridge problems.

First, the students, who split into groups of two, built bridges out of their team allotments of 10 sticks of spaghetti and 10 miniature marshmallows. To test the strength of their creations, they dropped individual M&Ms into a paper cup suspended from the bridge. While strength was a critical factor, the time spent to build the bridge and budget (extra marshmallows and sticks of spaghetti cost $10.00 each) were considerations in the overall project.

In the second project, the students worked a bridge problem that confronts DOT&PF engineers today. For the expanded float pond at Fairbanks International Airport, find the length and height of the bridge (from the water level to the bridge bottom) that will span the expanded float pond, as well as the elevation of the bridge bottom and the height of the bridge above the road. The students went on to figure the total cost of constructing the bridge, including the bridge, gravel, and paving. Students determined the design aircraft and factored in a safety margin, and computed the bridge size using maps, aerial photos, and researching information provided in handouts.

Teachers told parents about the engineering activities during parent/teacher conferences, which occurred during the week that Brown, Cole, and Hegdal visited the classrooms. Boyles indicated that several parents were thrilled about the exposure the students received to engineering careers, particularly as parents witnessed a budding interest from their high schoolers. •

Left & below: West Valley students test a spaghetti bridge.Right: Loena Hegdal explains a design problem at Fairbanks International Airport.

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that urban lane standards can be narrowed, freeing up added right of way. More cars can be moved through these cities when speeds are slower, while the delay increases for through traffic would be minimal.

In smaller towns faced with potential signals and wider roads, roundabouts could help hold off these impacts. And the State of Alaska could save on the maintenance and cost of remote signals.

One example would be in **Bethel,** where the main "Y" in town was recently realigned to match major street flows and reduce left turns, precluding the need for their first signal. As Bethel grows, a roundabout may be a future option.

Or, in **Kodiak,** the **"Y"** signal is in flash mode to help with difficult approach angles and sight distance. A roundabout may be a way to allow signal removal and reduce maintenance.

At **Homer Bypass and Lake Street**, a difficult "Y" intersection with little gaps was realigned and plumbed for what may become Homer's first future signal to maintain. A roundabout with a right turn bypass lane could preclude a signal and maintain the bypass intent.

ARE WE THERE YET?

The biggest obstacle to introducing roundabouts is lack of familiarity. In a scrutinizing and litigious society, it may be more comforting to select signals or all-way stops. However, the concerns and disbenefits of roundabouts have yet to be fully explored, demonstrated, or solved. The potential benefits of roundabouts are significant enough that perhaps the finer flaws can be overcome with some ingenuity and creativity. Then all Alaskans can benefit from having one more way of getting around obstacles.

Additional information on roundabouts is available fromUniversity of California Institute of Transportation Studies T2 Program. The Summer 1997 issue of Tech Transfer focuses on roundabouts. Also contact the Alaska T2 Center for videos and publications on roundabouts, including:

- Modern Roundabouts
- I-70/Vail Road•

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will help retain the audience's interest. Examples of real-life slides include road construction, building designs and computer visual simulations.

Tables and Charts. Tables and charts should be legible from the back of the room; otherwise they should be excluded from the presentation. Pie charts should be limited to no more than six slices and no slice should show less than 10 percent of the total. Keep multiple bars to a minimum when using bar charts.

Slide Orientation. All slides should be viewed through a projector before being used for a presentation to make sure they are in order, oriented correctly and legible. Backward or upside-down slides make a presentation seem amateurish and can add to your tension level.

Projector Equipment. Know how to operate the projector equipment before the session starts. Ensure that the tray fits the projector and that the projector is properly aimed at the screen and in focus before the beginning of the presentation. Again, make sure all sides are oriented correctly and that the remote control works properly. Use 80-slide trays since they are less likely to jam than ones that carry 140 slides. Always have a spare projector bulb handy. Turn off the projector when you are finished with your slides.

Overhead Projector. Layer your overheads with paper between each transparency to prevent them from sticking to each other. View the first transparency through the projector before the presentation to make sure you know how to orient the transparencies so that they are legible to the audience. Lay a pencil on the transparency to point to specific items. Turn off the projector as soon as you are finished with your visual aids to encourage the audience to focus on you. Do not block the screen with your body.•

Date	Event	Sponsor/Contact	Location
April 12-13	Alaska Water Resources Association Annual Conference & Meeting	Alaska Section AWRA, (907) 235-1066	Juneau, Alaska
April 12-13 April 15-16	Erosion and Sediment Control Training	International Erosion Control Association & Alaska T2 Center, IECA (800) 455-4322, fax (970) 879-8563	Anchorage, Alaska Anchorage Hilton Juneau, Alaska Travelodge Hotel
May 6 May 7 May 10 May 12	NHI #38060 Workzone Traffic Control for Maintenance Operations on Rural AK Highways	Alaska T2 Center, Sharon McLeod-Everette (907) 451-5323	Anchorage, Alaska Soldotna, Alaska Fairbanks, Alaska Juneau, Alaska
May 19-20	IRWA 803-Eminent Domain Law Basics for Right of Way Professionals	IRWA Chapter 71 & Alaska T2 Center, Sharon McLeod-Everette (907) 451-5323	Fairbanks, Alaska
May 21	Mock Trial- Managing Your Eminent Domain Strategy	IRWA Chapter 71 & Alaska T2 Center, Sharon McLeod-Everette (907) 451-5323	Fairbanks, Alaska
May 23-25	Fifth Annual Southeastern Local Roads Conference	FHWA & Tennessee Transportation Center, Jenny Jones (423) 974-5255, Fax (423) 974-3889	Gatlinburg, Tennessee
May 23-27	Seventh International Conference on Low-Volume Roads	TRB, LSU, PIARC & LDOT&D, Transportation Research Board National Research Council 2101 Constitution Ave, NW Washington, DC 20418	Baton Rouge, Louisiana Louisiana State University
August 16-19	10th International Conference on Cold Regions Engineering	ASCE, CRREL, Dr. Jon Zufelt (603) 646-4275, jzufelt@crrel.usace.army.mil	Lincoln, New Hampshire Mountain Club on Loon

Meetings Around Alaska

Society	Chapter	Meeting Days	Location
ASCE	Anchorage Fairbanks Juneau	Monthly, 3rd Tues., noon Monthly, 3rd Wed., noon Monthly, 2nd Wed., noon*	Northern Lights Inn Captain Bartlett Inn Westmark Hotel *except June-Aug.
ASPE	Anchorage Fairbanks Juneau	Monthly, 2nd Thurs., noon Monthly, 1st Fri., noon Monthly, 2nd Wed., noon*	West Coast International Inn Captain Bartlett Inn Westmark Juneau Hotel *except June-Aug.
ASPLS	Anchorage Fairbanks Mat-Su Valley	Monthly, 3rd Tuesday., noon Monthly, 4th Fri., noon Monthly, last Wed., noon	Executive Cafeteria, Federal Building Ethel's Sunset Inn Windbreak Cafe; George Strother, 745-9810
ITE	Anchorage	Monthly, 4th Tues., noon	Sourdough Mining Company
IRWA	Sourdoughs Ch. 49 Arctic Trails Ch. 71 Totem Ch. 59	Monthly, 3rd Thurs., noon** Monthly, 2nd Thurs., noon** Monthly, 1st Wed., noon	West Coast International Inn **except July & Dec. Last Frontier Club Mike's Place, Douglas
ICBO	Alaska Northern Chapter	Monthly, 1st Wed., noon	Zach's Sophie Station
AWRA	Northern Region	Monthly, 3rd Wed., noon, Brown Bag Lunch	Rm 531 Duckering Bldg., University of Alaska Fairbanks, Larry Hinzman, 474-7331
PE in Government	Anchorage	Monthly, last Fri., 7am	Elmer's Restaurant

This Is A Metric Job

Metric Q and A:

The construction industry is primarily a domestic industry. Why should it convert? It *must* convert to stay competitive. Although we don't export buildings and highways and bridges, we can't ignore global competition for construction services and products. Some basic products like brick, block, concrete, asphalt, and stone aggregates are produced and used locally, but almost everything else can be, often is traded internationally, including glass, coatings, finishes, fasteners, structural steel, wood, wood composites, and electrical, mechanical, plumbing and conveying equipment. U.S. architect/engineer/contractor services, which have been exported worldwide for decades, also represent an important part of the industry's revenues. Like it or not, we are all part of the global construction market.

If construction converts to the metric system, won't that eliminate one more barrier to imported products? Yes, but the alternative is restricting more of our products and services to within our own borders while the rest of the world goes about its business.

What has been the construction industry's response to metrication? In general, it's positive. Everyone reads the newspaper and knows we have to stay competitive. So the message from the industry largely is, "We understand the need to change – just don't drag it out."

How about the trades? Trades organizations have been very supportive, saying, "Tell us what you want and we will build it!" many are including metric measures in their educational programs or are offering special metric training.

Do building professionals like using the metric system? People who gain a working knowledge of the metric system come to prefer it. Gone are dimension strings made up of fractions, inches and feet – with the metric system it's all millimeters. And gone are a multitude of other conversions. For example, which has a higher thermal output, a 22 million Btu/hour boiler or a 1000 ton chiller? Using metric units, you can tell instantly: the boiler is a 6.4 MW and the chiller is 3.5 MW.

What about product conversion? Except for a handful of modular products, very few products change size. Instead, they simply are relabeled in metric units. A 2 ¾ x 4 ½ inch wall switch face plate might be relabeled 70 x 115 mm and a 10 horsepower motor, 7500 W. The products themselves don't change in any way.

But how about modular products? Most change size to fit into a 100 millimetr module. Drywall, plywood, and rigid insulation widths change slightly, from 48 inched to 1200 mm, although their thicknessess remain the same. Concrete block, suspended ceiling systems and raised flooring systems also change size, but that's about it.

What happens to the traditional 2-by-4? As we all know, "2-by-4" is a name, not a finished size. Neither wood nor a light gage steel framing change size in cross-section, but they are spaced at 400 mm intervals instead 16 inches – about ¼ inch closer together.

Are there other products in the same category? Yes. A 2-inch pipe has neither an inside nor an outside diameter of 2 inches. A ½ -inch sprinkler head contains no actual ½-inch dimension. A 24-inch structural steel section contains no actual 24-inch dimension. Since these products are not really produced in rounded inch-pound dimensions, there is no reason to change their sizes to rounded metric dimensions. Instead, they are just relabeled in metric units as, for example, 50 mm pipe, 13 mm sprinkler heads, and 610 mm beams. As mentioned previously, almost all construction products fall within this "relabeling" category.

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So "going metric" in construction isn't so difficult? Although people who have been through the conversion process say it's easier than they expected, there are some problems and inconveniences and they shouldn't be minimized. But if construction problems are rated from one to ten, with ten the most difficult, metric conversion is only a one or a two. The U.S. construction industry is arguably the best in the world, other countries have converted with little difficulty and we can, too.

How long will conversion take? Most federal building construction and state and federal highway work is being metricated now. That's making waves throughout the industry. No one knows how long it will take to convert everything else, but if we all get behind metrication, it won't take long. In the end, it's really up to you.•

Exerpted with permission form the "This is a Metric Job" poster by the Construction Metrication Council, 1998. For a copy of the poster, contact the Council at (202) 289-7800 and ask for publications.

Free Publications!

The Alaska T2 center has several publications available on a first-come, first-served basis. Please come by or contact us if you would like your own copy of these publications.

- *Engineering Technician Training Guide, Wage Group 55/54 & Wage Group 57 Solutions,* 1998 Reprint, John Ryer, P.E. & James Weed, P.E.
- *Basic Training, Mathmatics and Surveying,* 1998 Reprint, Jack Fullerton.
- *Construction Project Documentation,* 1998 Reprint, Jack Fullerton.
- *Advanced Composites in Bridges in Europe and Japan,* December 1997, FHWA.
- *Asphalt Roadway Rehabilitation Alternatives: A Training Course,* FHWA-SA-97-048.
- *Snow Fence Guide,* SHRP-W/FR-91-106, Ronald Tabler.
- *Utility Cuts in Paved Roads, Field Guide*, FHWA-SA-97-049.•

Make Your Voice Heard! Brief Survey on Technology Transfer Coming to Local and Tribal Governments

In the coming months, you may receive a copy of a short survey from the Federal Highway Administration (FHWA). The questionnaire asks about your organization's use of the training and technology transfer services of the —[insert your Center's name here]—and how those services might be improved to better meet your needs. FHWA is mailing the questionnaire to 2,400 local and tribal governments in the U.S. and Puerto Rico.

We are expecting a great response to this survey! It is important that everyone who receives a questionnaire completes it. If you are a recipient, please answer and return it promptly in the postage-paid, pre-addressed mailer provided. Everyone who completes the questionnaire will receive a summary of the results of the survey. The summary should be distributed in the fall of this year.

This may be your chance to provide valuable feedback and affect a federal program designed for you. Responses from customers of all the Technology Transfer, LTAP and Tribal Technical Assistance Program Centers in the U.S. and Puerto Rico will be combined to assess the program's impact nationally.

If you have any questions or comments about this survey, contact Dr. Anna Bennett, FHWA's LTAP Project Manager by e-mail at Anna.Bennett@fhwa.dot.gov or by phone at 415/744-2616.We appreciate your helping ensure that LTAP provides the highest quality service possible.•

Computer Crashes Great for Roadside Safety Research

by Amy Protas, Texas Transportation Institute

In the 1950s, TTI began crash testing. This usually involved vehicles, test drives and a stretch of highway. Half a century later, and with the help of a new national research center, TTI's crash testing has added a "cyber" twist. Now, testing involves computers, hard drives and a stretch of "virtual" highway.

TTI is one of four university-based centers of excellence in DYNA3D analysis established by the Federal Highway Administration (FHWA). Martin Hargrave, research engineer for FWHA, says TTI is a good site because of its reputation as a leader in roadside safety research and the prominence of its crash testing facility. "TTI was selected on the basis of an outstanding proposal that included highly qualified personnel, excellent computing facilities and an on-site crash test facility," Hargrave says. "TTI also secured additional funds from both Texas A&M University and the Texas Department of Transportation (TxDOT). These additional funds will leverage the new center."

DYNA3D is a computer simulation program that models vehicle impacts involving roadside structures such as signs, supports, guardrails and crash cushions. The Centers of Excellence in Transportation Computational Mechanics, also located at the University of Cincinnati, the University of Iowa and the University of Nebraska, are further developing and utilizing DYNA3D to improve roadside safety.

Roger Bligh, manager of TTI's Highway Safety Structures Program, says the computer program is more efficient than traditional crash testing. "The biggest advantage DYNA3D has over traditional crash testing is its cost- effectiveness," Bligh says. "With the program, we can look at a variety of scenarios that we typically can't study by traditional crash testing methods. We're

Viewing crashes on a computer screen give researchers the ability to study a multitude of angles and possibilities.

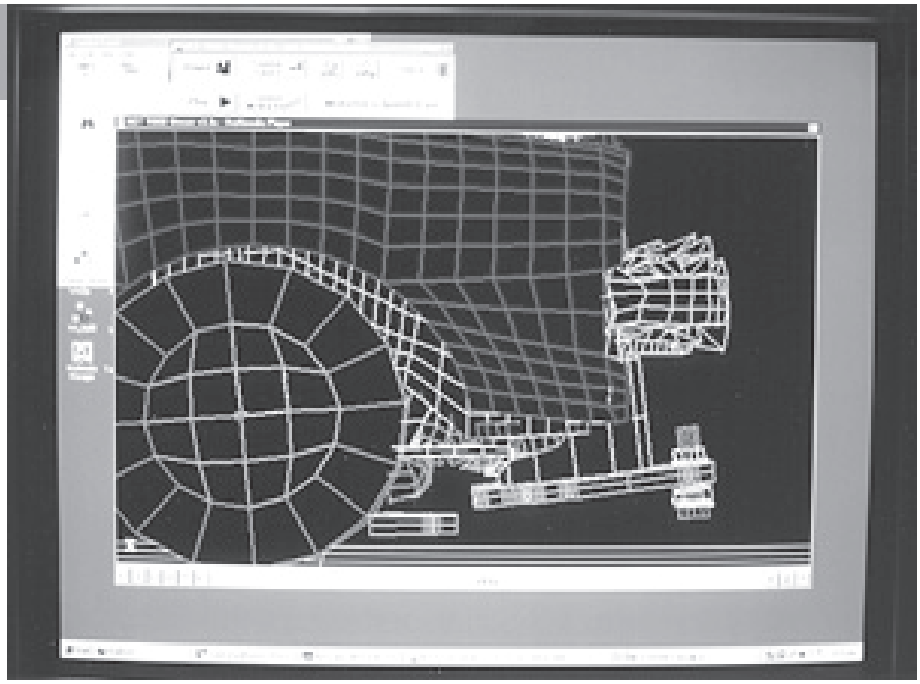
As a follow-up to the article in the last issue about computer viruses, a reader notified us that the article wasn't clear about where virus software needed to be installed. Each computer should have an anti-virus system installed. Even sources that should be safe may have an unexpected bug attached to them.•

Internet Update

For information on the World Summit on Nordicite, held February 2-5, 1999 in Quebec City, look up the Web site at: http://www.nordicite.org/en/home.htm. The site has information about adapting to the cold, including transportation, environmental, and government related issues.•

often technologically or monetarily limited with what we can do in terms of real-world testing, but we're not limited by such constraints on the computer."

Using the DYNA3D program and models, users have the flexibility to simulate a crash from different angles and speeds without the cost of repairing or replacing the structure or vehicle for each test. The program can be used to simulate various real-world conditions like roadside terrain. Researchers can also graphically view these impacts from different angles to more fully study how the structure or vehicle reacts. They can delete elements, such as the roof or hood of a car, to see how internal elements are affected during the impact—an effect that would be difficult to study in an actual crash test.



DYNA3D models vehicle impacts involving roadside structures such as supports, guardrails or even utility poles.

Although it's not feasible to test all of these combinations in actual tests, simulations allow more design variations to be analyzed without significant additional costs. With these results, researchers can make adjustments to existing structures or develop improved structures.

Each of the individual parts of a vehicle or roadside structure model are defined using a mesh of small elements. Computer-aided design programs are sometimes used to define the geometry of the component onto which the element mesh is mapped. Material properties are then defined for the elements, and the components are assembled into a final model. The National Crash Analysis Center is developing the vehicle models, and TTI is developing models of roadside structures into which these vehicles are impacted. By simulating how the vehicle and structure will act on impact, researchers can make design adjustments to the structure before ever running a full-scale crash test.

As safety standards in the transportation industry continually change to reflect new vehicle designs and operating speeds, the simulation program can help find a means for developing improved safety features or upgrading existing roadside structures to meet the new standards. But Bligh emphasizes that computer simulation alone doesn't provide a complete picture. "We still have a ways to go. Clearly, we want to continue to increase the sophistication and accuracy of our models and develop more confidence in what we're doing. It will complement and perhaps eventually reduce the amount of crash testing needed, but it will not replace it."

Depending on the nature of a particular safety feature, its approval for use on the roadside may be based on as few as one or two crash tests conducted using practical worst-case conditions. Bligh says the flexibility of computer models will help study real-world conditions that are difficult to simulate in actual crash tests. "With a properly validated model," Bligh says, "we can use DYNA3D simulations to supplement crash testing by investigating other conditions. This will enable researchers to fill some of the gaps in knowledge that currently exist."

TTI will also look at other potential uses for DYNA3D in transportation research. Possibilities include dynamic analysis of pavements, automobile crashworthiness and train/vehicle impact simulations.

For more information:

Contact: Roger Bligh
E-mail: rbligh@tamu.edu
Phone: 409/845-4377•

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Publications for Loan

Place a check by the publication you would like to borrow.

_____ **Our Nation's Highways,** US DOT, FHWA Office of Highway Information Management, FHWA-PL-98-015, 1998

_____ **ICETHK User's Manual Version 1,** US Army Corps of Engineers, Cold Regions Research & Engineering Laboratory, Special Report 98-11, Sept 1998

_____ **A Qualitative Assessment of the Role of Shippers and Others in Driver Compliance with Federal Safety Regulations,** US DOT, FHWA, FHWA-MC-98-049, Dec 1997

_____ **Performance of Steel Pipe Pile-To-Concrete Bent Cap Connections Subject to Seismic or High Transverse Loading Phase 1,** Department of Civil Engineering, Montana State University, FHWA/MT-98-005/8117-7, June 1998

_____ **Ground Freezing Effects on Soil Erosion of Army Training Lands, Part 2: Overwinter Changes to Tracked-Vehicle Ruts,** Yakima Training Center, Washington, CRREL, Special Report 98-8, July 1998

_____ **Management of Surface Transportation Systems,** TRB-NRC, NCHRP Synthesis 259, 1998

_____ **Statistical Models of Accidents on Interchange Ramps and Speed-Change Lanes,** US DOT, FHWA, FHWA-RD-97-106, June 1998

_____ **Evaluation of Innovative Monitoring Systems for the Queen Isabella Causeway to Assit in the Preservation of Endangered Brown Pelicans**, Texas Transportation Institute, Texas DOT, Project Summary Report 2973-S, Sept 1997

_____ **Geographic Information System for Hydrologic Data Development for Design of Highway Drainage Facilities,** Center for Transportation Research, Research Report 1738-3, Aug 1997

_____ **Mixture Design and Performance Prediction of Rubber-Modified Asphalt in Ohio,** Ohio DOT, US DOT, FHWA, Final Report, June 1998

_____ **Application of Outdoor Advertising Controls on Indian Land,** TRB-NRC, Legal Research Digest #41, June 1998

_____ **Soil-Vapor Versus Discrete Soil Sample Measurements for VOCs in the Near-Surface Vadose Zone - Feasibility Study,** CRREL, Special Report 98-7, June 1998

_____ **Constructibility Review Process for Transportation Facilities,** Transportation Research Board - National Research Council, NCHRP Report 390, 1997

_____ **Performance Characteristics of Open-Graded Friction Courses,** Transportation Research Board - National Research Council, NCHRP Synthesis 180, 1992

New Publications and Videos

_____ **Maintenance Considerations in Highway Design,** Transportation Research Board - National Research Council, NCHRP Report 349, 1992

_____ **Asphalt Mixture Design,** Transportation Research Board - National Research Council, TRR 1353, 1992

_____ **Recycled Tire Rubber in Asphalt Pavements,** Transportation Research Board - National Research Council, TRR 1339, 1992

_____ **Hydrology and Bridge Scour,** Transportation Research Board - National Research Council, TRR 1350, 1992

_____ **Geoenvironmental and Engineering Properties of Rock, Soil, and Aggregate,** Transportation Research Board - National Research Council, TRR 1345, 1992

_____ **Part 1 - 1992 TRB Distinguished Lecture, Part 2 - Developments in Flexible Pavements Design,** Transportation Research Board - National Research Council, TRR 1354, 1992

_____ **Pavement Rehabilitation,** Transportation Research Board - National Research Council, TRR 1374, 1992

_____ **Modulus 4.0: Expansion & Validation of the Modulus Backcalculation System,** Texas Transportation Institute - US DOT, Research Report 1123-3, 1990

_____ **Value Engineering For Highways,** US DOT & FHWA, FHWA-HI-88-047, 1983

_____ **A Microcomputer Based Procedure for Backcalculating Layer Moduli From FWD Data,** Texas Transportation Institute - US DOT, Research Report 1123-1, 1988

_____ **Ecological Effects of the Wickersham Dome Fire Near Fairbanks, Alaska, Pacific Northwest Forest and Range Experiment Station,** US Department of Agriculture, General Technical Report PNW-90, July 1979

_____ **Proceedings Workshop in Pavment Rehabilitation,** FHWA, Salt Lake City, Utah, FHWA-TS-84-224, Sept. 1984

_____ **Summary Report on Permanent Deformation in Asphalt Concrete,** Strategic Highway Research Program National Research Council, SHRP-A/IR-91-104, 1991

_____ **Cold-Recycled Bituminous Concrete Using Bituminous Materials,** Transportation Research Board - National Research Council, NCHRP Synthesis 160, 1990

_____ **Pavement Management Methodologies to Select Projects and Recommend Preservation Treatments,** Transportation Research Board - National Research Council, NCHRP Synthesis 222, 1995

_____ **Cost-Effective Preventive Pavement Maintenance,** Transportation Research Board - National Research Council, NCHRP Synthesis 223, 1996

_____ **Hydrology, Hydraulics, and Water Quality,** Transportation Research Board - National Research Council, TRR 1420, 1993

_____ **Progress Report on Maintenance and Operations Personnel,** Transportation Research Board - National Research Council, TRC#420, March 1994

_____ **Public Outreach Handbook for Departments of Transportation,** Transportation Research Board - National Research Council, NCHRP Report 364, 1994

_____ **Nondestructive Deflection Testing and Backcalculation for Pavements,** Transportation Research Board - National Research Council, TRR 1377, 1992

_____ **Environmental Issues Related to Materials and Stabilization,** Transportation Research Board - National Research Council, TRR 1424, 1993

_____ **Pavement Analysis, Design, Rehabilitation, and Environmental Factors 1991,** Transportation Research Board - National Research Council, TRR 1307, 1991

_____ **Severity Indices for Roadside Features, A Synthesis of Highway Practice,** Transportation Research Board - National Research Council, NCHRP Synthesis 202, 1994

_____ **Constructibility Review Process for Transportation Facilities Workbook,** Transportation Research Board - National Research Council, NCHRP Report 391, 1997

_____ **Criteria for Highway Routing of Hazardous Materials,** Transportation Research Board - National Research Council, NCHRP Synthesis 261, 1998

_____ **Instrumentation for Measuring Scour at Bridge Piers and Abutments,** Transportation Research Board - National Research Council, NCHRP Report 396, 1997

_____ **Sonar Scour Monitor,** Transportation Research Board - National Research Council, NCHRP Report 397A, 1997

_____ **Magnetic Sliding Collar Scour Monitor,** Transportation Research Board - National Research Council, NCHRP Report 397B, 1997

_____ **Strength and Deformation Characteristics of Pavement Structures,** Transportation Research Board - National Research Council, TRR 1384, 1993

_____ **Part 1 - 1993 TRB Distinguished Lecture, Part 2 - Developments in Concrete Technology,** Transportation Research Board - National Research Council, TRR 1382, 1993

_____ **Conference on SHRP Asphalt Research,** Transportation Research Board - National Research Council, TRR 1386, 1993

_____ **Innovations in Construction,** Transportation Research Board - National Research Council, TRR 1389, 1993

Software available for loan

_____ **Linear Referencing Systems in Geographic Information Systems,** Bureau of Transportation Statistics, U.S. DOT

_____ **Pavement Recycling Guidelines for State and Local Governments,** National Center for Asphalt Technology, US DOT & FHWA (contains digital format of the manual must be read using Adobe Acrobat, also MS PowerPoint viewer)

Videos available for loan

_____ **Building the Notched Wedge Joint,** 7:55, National Asphalt Pavement Association (NAPA), 1998

_____ **FWD Calibration Centers: Why do we need them?,** 7:20, September 1991

_____ **Transportation Librarians/ Partners in Technology Transfer,** 10:30, MN/DOT. September 1998

These materials may be borrowed for three weeks. However, if you need them longer, contact our office for an extension. Contact **Christel Kennedy** at (907) 451-5320 or TDD: (907) 451-2363.

Please print your name and address below, and mail, fax, or E-mail to:

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Local Technical Assistance Program (LTAP)
Department of Transportation and Public Facilities
2301Peger Road M/S 2550
Fairbanks, AK 99709-5399
Fax: (907) 451-2313
E-mail to: Christel_Kennedy@dot.state.ak.us

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Organization:_____
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City:_____ **State/Province:**_____ **Zip:**_____
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New materials available for loan.

Controlling Corrosion, Alaska DOT&PF. *Jack Tinnea & Kerri Howell.* Manual from workshop presented by Tinnea & Associates and Alaska Technology Transfer. Manual includes information on corrosion and methods of control.

Rapid Replacement of Bridge Decks, NCHRP Report 407. *Maher K. Tadros & Mantu C. Baishya.* This report contains an evaluation of rapid bridge-deck replacement methods and to develop better procedures and superstructure designs. Also included is a review of continuous precast prestressed stay-in-place concrete system and girder-to-deck connections that would substantially reduce bridge-deck construction and replacement time.

Working Smart with Executive Strategies, National Institute of Business. Newsletters contain information for dealing with coworkers and tips for advancing and working productively.

Technology for Learning, Lakewood Publications. Newsletters include information on computer technology and Internet secrets. Also includes information on new software and equipment.

Effects of Segregation on Mix Properties of Hot Mix Asphalt, K-TRAN: KU-96-6. *Steven A. Cross, Mohd Rosli Hainin, Alex Adu-Osei.* This report contains information from a study of four newly constructed pavements with noticeable spots of segregation. Cores were taken and tested for asphalt weight, nuclear gauge unit weight, core unit weight, macro texture, moisture sensitivity, fatigue life, and indirect tensile strength. Results indicated that segregation causes a drop in unit weight, indirect tensile strength, moisture resistance and fatigue life, and an increase in permeability of asphalt mixes.

Performance of KDOT Temporary Erosion Control Measures, K-TRAN: KU-97-2. ***Bruce M. McEnroe, Brian J. Treff.*** This study looks at ways to develop practical guidelines for temporary erosion control on highways. Recommendations are based on field monitoring, on-site testing of alternative measures, questionnaire responses from KDOT construction personnel, and a review of other organizations' practices.

KDOT Temporary Erosion-Control Manual: A Guide for the Design, Installation, Inspection, and Maintenance of Temporary Erosion-Control Measures in Kansas, December 1997. This manual provides tools for implementing practical and efficient stormwater pollution prevention plans (SWPPPs). Each chapter includes sections on design, installation, inspection and maintenance for temporary erosion-control measures (TECMs).

High Performance Concrete Pavement, FHWA-KS-98/2. *John B. Wojakowski.* This report covers the High Performance Concrete Pavement (HPCP) research project conducted by KDOT and funded by FHWA. Specific test sections generally one-half to one kilometer in length were built with special features and materials. Laboratory testing was done on innovative materials and mixtures. Evaluation and monitoring of the test sections will be continues through the next five years.

Nondestructive Condition Assessment of a Posted Bridge, FHWA/OH-97/011. *Daniel N. Farhey, Razi Naghavi, Alper Levi, Aniruddha M. Thakur, Relva C. Buchanan, Narayanan Jayaraman, and* ***Ahmet Emin Aktan.*** This report describes the Tindall Bridge study. The objective was to show it is possible to design the restoration and preservation of a historical bridge by integrating advanced technologies with sound, heuristic-based structural engineering. •

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Take the time to do it right.

A little extra effort throughout the project can make for more reliable results in the end. Develop rules for input so that consistent data formats are used. Follow calibration rules and consult the software documentation anytime you have a question about input requirements. Realize that data is not always perfect and develop rules for dealing with this. For example, some accidents may have been reported based on traffic volume while others were listed based on mile of roadway.

Don't forget to document everything! This can make it much easier in the future when staff running the program find new employment, managers require proof of the results, or results seem flawed. If you make notes during the process, it will be easier to fix problems later.

Do not expect miracles.

Even with the best computer equipment and software programs you will encounter problems. No program is perfect and no results will be perfect. Set a reasonable margin of error and learn to live within that margin. Also, learn to recognize the error. It would be unwise to stake your reputation or that of your company on results just because "the computer said so."

Use common sense.

If something looks wrong, chances are it is. No matter how complex a computer program is, there is no substitute for good old-fashioned common sense. Use it to review input, output, and the process itself.

There are several questions you should ask:

- Do the results look accurate overall?
- Do any numbers stand out?
- Can the results be interpreted in a different political or educational background?

Ask your resident expert on the subject for his or her review as well. Knowing the answers to these questions will give you a deeper understanding of the computer's results and help you to defend them once you are convinced of their validity.•

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